Journal of Forensic and Legal Medicine 16 (2009) 354–356

Contents lists available at ScienceDirect

Journal of Forensic and Legal Medicine

journal homepage: www.elsevier.com/jflm

Case Report

Fatal cranial shot by blank cartridge gun: Two suicide cases

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ARTICLE INFO

Article history:
Received 10 January 2009
Accepted 14 January 2009
Available online 13 February 2009

Keywords:
Blank cartridge gun
Suicide
Autopsy

ABSTRACT

Blank firing pistols are generally considered to be harmless and these guns are not accepted as being firearms in most countries. Due to lack of legal regulations these guns are easily purchased by anyone aged over 18 years. Reports of serious injuries and even fatalities due to these guns are increasing in the literature.

These guns when modified or even unmodified can cause serious and potentially fatal injuries. Without doing any changes to the barrel, using blank or tear gas cartridges, firing at contact range can cause penetration of gas into the body including bone originated from gunpowder.

We report two suicide cases shooting themselves at temporal region with a blank cartridge gun at contact range. There was no foreign body on radiological examination and there was no trajectory of a bullet inside the brain. In both cases the wound was at the right temporal region and there was defect at temporal bone. There was circular soot around this bone defect. The injury of the brain tissue was localized at the level of the defect but there was widespread subarachnoidal bleeding.

We discussed the potential danger of these guns and stressed the need of legal regulations concerning these guns.

1. Introduction

The acquisition and possession of firearms is limited by law in most countries including Turkey as well. Those prevented by law from obtaining a regular firearm may procure one illicitly or resort to blank cartridge guns. Thus, the development of blank cartridge guns is closely related to the regulations restricting availability of firearms for civilians.[1]

Blank cartridge guns are generally regarded as being harmless and are not considered to be firearms in legal sense in most countries.[2] Several reports have been reported showing serious injuries and even fatalities due to unmodified blank cartridge guns.[3–5] Upon simple modifications such as discarding the barrier in the barrel, these blank cartridge guns gain the ability to propel small balls placed inside the cartridge or handmade missiles inserted into the tip of the cartridges.

Without performing any changes to the barrel, using blank or tear gas cartridges, firing at contact range can also cause penetration of gas originated from gunpowder into tissues, including bone.[6,7] Üner et al.[8] reported that firing with a 9 mm blank cartridge, it is quite possible to penetrate a 0.5 cm thick, piece of polywood, with a result of a hole of 2 cm diameter.

We report two cases where fatal cranial injuries were caused by blank cartridge guns. The weapons were loaded with blank cartridges. Neither live ammunition nor any form of projectile was used. All two cases involved a contact discharge. The gas pressure caused by firing the weapons created extensive wound cavities and defect in the skull. Each victim died from brain hemorrhage and brain tissue damage.

2. Case report

CASE I. A 23 years old man had been found dead at his own house with a blank cartridge gun next to him. There was no sign of struggling and signs of fore to open the door. After examination of the corpse at the crime scene by the team of crime scene investigation, the body was transferred to hospital morgue for external examination by the prosecutor. After examination the body was transferred to the Council of Forensic Medicine for a forensic autopsy. External examination of the body before autopsy revealed the presence of a star-like gunshot wound with muzzle imprint at right temple. There is soot dispersed between the lips of the wound. Radiological examination revealed no foreign body in the body and there was no exit wound. Autopsy showed a wound on the right temple consisted of an extensive cavity filled with powder particles and soot. There was a defect measuring 2×1.5 cm at the temporal bone. The defect was surrounded by soot. There was internal beveling in this bone defect. The brain was weighed 1340 g and subdural hematoma having almost 1 cm thickness was detected at the right temporal region. There was widespread subarachnoidal bleeding particularly at the right temporal region

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doi:10.1016/j.jflm.2009.01.011

Fig. 1. Gunshot wound with muzzle imprint at right temple.

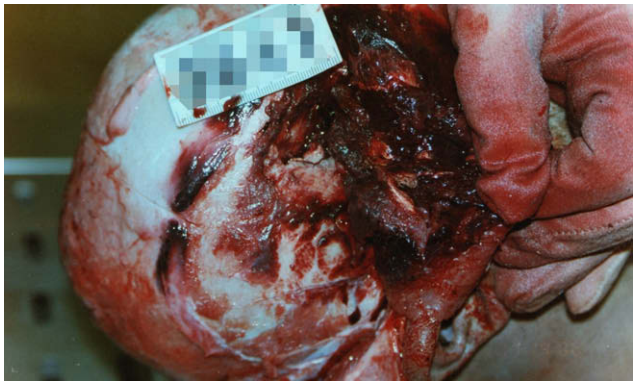

Fig. 2. Cavity filled with powder particles and soot in the right temporal muscle group and bone defect surrounded by soot at the temporal bone.

Fig. 3. Gunshot wound with muzzle imprint at left temple.

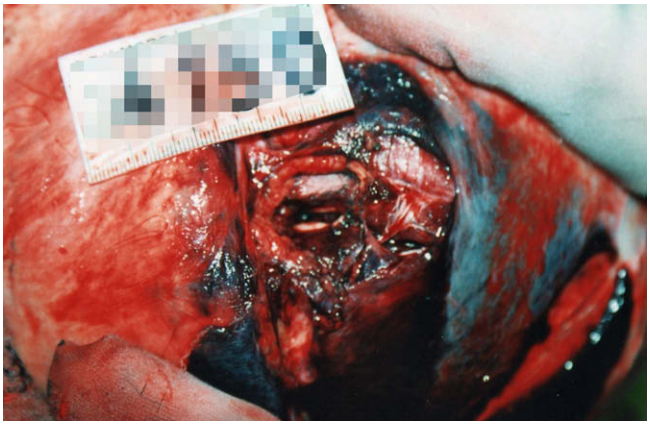

Fig. 4. Cavity filled with powder particles and soot in the left temporal muscle group.

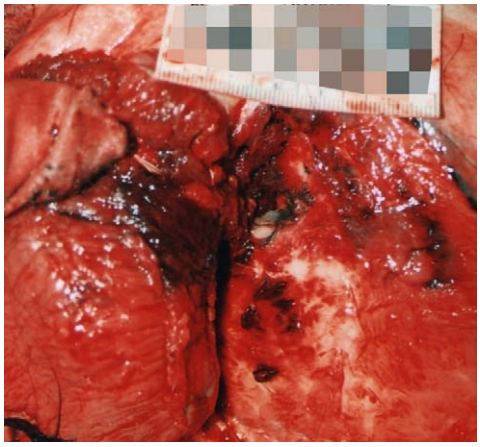

Fig. 5. Bone defect surrounded by soot at temporal bone.

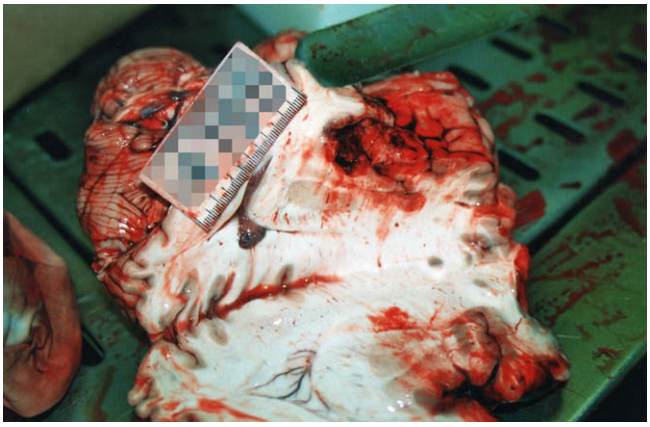

Fig. 6. Brain hemorrhage and no bullet trajectory on sections of the brain.

and contusions at right temporal lobe of the brain. Right anterior cranial fossa and right middle cranial fossa showed fractures. There was no typical gunshot trajectory in the brain tissue (see Figs. 1 and 2).

CASE II. A 17 years old male was dead on admission to hospital. He attempted suicide by a blank cartridge gun. After examination by prosecutor, the body was sent to Council of Forensic Medicine for autopsy. On external examination of the corpse, an atypical gunshot wound with muzzle imprint at left temporal region. There was accumulation of soot between the lips of the wound. Radiolog-

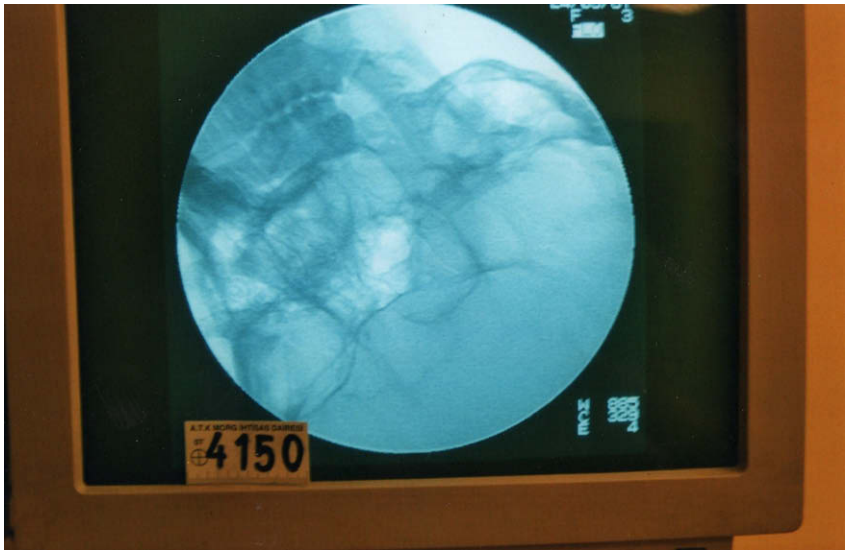

Fig. 7. Radiological image showing absence of any foreign body in cranial cavity.

ical examination revealed no foreign body in the body and there was no exit wound. Dissection of the scalp yielded a wound on the left temple consisted of an extensive cavity filled with powder particles and soot. There was a bony defect at left temporal bone with a circular zone of soot. The brain weighed 1435 g and there was subdural hematoma covering the entire left hemisphere. There was local brain injury at left temporal region and subarachnoidal bleeding surrounding this area. The brain tissue damage was focal and deep only 1 cm. There were linear fractures at the border of left middle cranial fossa and left anterior cranial fossa. At this part of the cranial basis the dural cover was intack and there was no bullet trajectory (see Figs. 3, 4 and 7).

3. Discussion

These cases impressively demonstrate the error of the widespread belief that blank cartridges are "harmless". The gas pressure at the muzzle of a gun when a blank cartridge is fired is so great that if the gun is placed directly on the surface of the body, it can cause destruction of the skin and underlying structures including bones (see Figs. 5 and 6).

It was shown by ballistic experiments that even unmodified blank cartridge guns and very small caliber weapons can fire wire nails and can inflict potentially fatal injuries even at distances of 50 cm.[1] Ballistic considerations and wounding patterns suggest that gas jet alone generated by nonmanipulated commercially available blank cartridge gun demonstrates the characteristics of a missile when fired at close range. Contact or very close-range shots will produce an entry wound of the skin surrounded by a punch mark of the muzzle. The skin may rupture in a star-like pattern resulting from pressure buildup. In both of the cases the contact range shots resulted in this type of entry wounds (see Fig. 7).

Shots from blank cartridge guns placed to the neck and thorax generally may be fatal, other injury sites involving destruction of larger vessels as well. In adults, thickness of the temporal bone rarely exceeds 2–3 mm. this part of the head is the frequently site of the placements of suicidal gunshots. This is also confirmed for suicide cases using blank cartridge guns.[9–11] In both of our cases the selected sites for suicidal shot was temporal region. Complex impression fractures in temporal bone and other neighboring bony structures are reported to be seen in these shots. The hydrodynamic expansion of the pressure wave in the brain tissue may result in distant injuries.

As a conclusion, blank cartridge guns are dangerous weapons contrary to public opinion. They may inflict potentially fatal injuries to neurocranium when fired at contact range of fire. In these guns, the gas jet behaves like a projectile in contact range. Impression fractures and dislocation of temporal bone fragments are common in these wounds. Hematomas, subarachnoid hemorrhage and increased intracranial pressure are major pathologies leading to death.

Conflict of Interest

None declared.

Funding

None declared.

Ethical approval

None declared.

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